

WHAT IS CLAIMED IS:

1 1. An apparatus for processing a substrate, the apparatus comprising:
2 (a) a first atmospheric deposition station;
3 (b) a second atmospheric deposition station comprising an atmospheric
4 pressure vapor deposition chamber, wherein the first atmospheric deposition station and the
5 second atmospheric deposition station are coupled together; and
6 (c) a substrate handling system adapted to transfer substrates between the
7 atmospheric deposition station and the second atmospheric deposition station.

1 2. The apparatus of claim 1 wherein the first atmospheric deposition
2 station comprises a spin coating chamber.

1 3. The apparatus of claim 1 wherein the first atmospheric deposition
2 station comprises an ultrasonic spray deposition device.

1 4. The apparatus of claim 1 further comprising:
2 a plasma system associated with the atmospheric pressure vapor deposition
3 chamber.

1 5. The apparatus of claim 4 wherein the plasma system is a remote
2 plasma system that is adapted to form a plasma upstream of the atmospheric vapor deposition
3 chamber.

1 6. The apparatus of claim 1 further comprising a curing station.

1 7. The apparatus of claim 1 wherein the substrates are semiconductor
2 substrates.

1 8. The apparatus of claim 1 wherein the first atmospheric deposition
2 station is adapted to deposit a layer to be formed into a porous dielectric layer on the
3 substrate, and second atmospheric deposition station is adapted to deposit a capping layer on
4 the porous dielectric layer.

1 9. The apparatus of claim 1 wherein the atmospheric vapor deposition
2 chamber is an atmospheric chemical vapor deposition (APCVD) chamber.

1 10. The apparatus of claim 1 wherein the first atmospheric deposition
2 station comprises a liquid dispenser.

1 11. An apparatus for processing semiconductor substrates, the apparatus
2 comprising:

3 (a) an atmospheric chemical vapor deposition chamber;
4 (b) a plasma system associated with the atmospheric chemical vapor
5 deposition chamber;
6 (c) a spin coating chamber coupled to the atmospheric deposition
chamber;
7 (d) a curing station coupled to the atmospheric deposition chamber; and
8 (e) a substrate handling system adapted to transfer substrates between the
9 atmospheric deposition chamber, the spin coating chamber, and the curing station.

10 12. The apparatus of claim 11 wherein the plasma system is a remote
11 plasma system adapted to generate a plasma upstream of the atmospheric chemical vapor
12 deposition chamber.

13 13. The apparatus of claim 11 wherein the substrate handling system
14 comprises a plurality of substrate handlers with arms.

15 14. The apparatus of claim 11 wherein the apparatus is a cluster tool.

16 15. The apparatus of claim 11 wherein the spin coating chamber is adapted
17 to deposit a layer that is to be formed into a porous dielectric layer, and wherein the
18 atmospheric chemical vapor deposition chamber is adapted to deposit a cap layer on the
porous dielectric layer.

19 16. A method for processing a substrate using a substrate processing
20 apparatus, the method comprising:

21 (a) depositing a first layer on a substrate at atmospheric pressure at a first
atmospheric deposition station;
22 (b) transferring the substrate to an atmospheric vapor deposition chamber
23 at a second atmospheric deposition station using a substrate transfer system; and

7 (c) depositing a second layer on the substrate at atmospheric pressure
8 within the atmospheric vapor deposition chamber at atmospheric pressure.

1 17. The method of claim 16 wherein the substrate is a semiconductor
2 substrate.

1 18. The method of claim 16 wherein the first atmospheric deposition
2 station comprises a spin coating chamber.

1 19. The method of claim 16 further comprising:
2 forming a porous dielectric layer from the deposited first layer, and wherein
3 depositing the second layer on the substrate comprises depositing the second layer on the
4 porous dielectric layer.

1 20. The method of claim 19 wherein the porous layer and the cap layer
2 comprise dielectric materials.

1 21. The method of claim 16 further comprising:
2 curing the first layer at a curing station.

1 22. The method of claim 16 wherein the atmospheric vapor deposition
2 chamber is an atmospheric chemical vapor deposition (APCVD) chamber.

1 23. The method of claim 16 wherein depositing the first layer comprises
2 depositing a liquid on the substrate.

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